

REMARKS

Claims 1 and 3 through 23 are in the application, with Claim 1 having been amended, Claim 2 having been cancelled, and Claims 7 through 23 having been withdrawn from consideration. Of the claims under consideration (1 and 3 through 6), only Claim 1 is independent. No new matter has been added. Reconsideration and further examination are respectfully requested.

Contrary to the outstanding Office Action, Applicants note that the prior Response described distinct and specific errors in the prior Restriction Requirement, and therefore should be considered an election with traverse.

Claims 1, 4 and 5 stand rejected under 35 U.S.C. §102 as allegedly being anticipated by U.S. Patent No. 6,861,689 (Burnett); Claim 2 stands rejected under 35 U.S.C. §103 over Burnett in view of U.S. Patent No. 6,583,001 (Burr); and Claim 3 stands rejected under §103 over Burnett in view of Burr and other information noted in the Office Action. Reconsideration and withdrawal of the rejections are respectfully requested.

Amended independent Claim 1 relates to a memory cell that includes a substrate doped with charge carriers of a first type, a body region disposed within the substrate and doped with charge carriers of the first type, a source region disposed in the body region and doped with charge carriers of a second type, and a drain region disposed in the body region and doped with charge carriers of the second type. The body region and the source region form a first junction, and the body region and the drain region form a second junction. A conductivity of the first junction from the body region to the source region in a case that the first junction is unbiased is substantially less than a conductivity of the second junction from the body region to the drain region in a case that the second junction is unbiased.

In one embodiment of Claim 1 illustrated in FIG. 2 of the present application, substrate 30 is doped with p-type charge carriers, and body region 11 is disposed within substrate 30 and doped with p-type charge carriers. Source region 12 and drain region 13 are disposed within body region 11 and doped with n-type charge carriers. As described at page 2, line 26 through page 3, line 2, a conductivity of a first junction from body region 11 to source region 12 is substantially less than a conductivity of a second junction from body region 11 to drain region 13

if the junctions are unbiased. The foregoing features may improve charge retention within body region 11 and/or facilitate the manipulation of charge within body region 11 in comparison to other non-Silicon On Insulator (SOI) arrangements.

The art of record is not seen to disclose or to suggest the foregoing features of independent Claim 1. Specifically, the art of record is not seen to disclose or to suggest at least a substrate doped with charge carriers of a first type, a body region disposed within the substrate and doped with charge carriers of the first type, and a source region and drain region, both disposed in the body region and doped with charge carriers of a second type.

Burnett describes an SOI device in which regions 114, 120 and 122 are clearly not disposed within body region 106. A body region of an SOI device, in contrast to the present claim language, is isolated from other body regions and therefore cannot contain a drain region or a source region. In this regard, Burnett is similar to the systems described as “undesirable” in the Background of the present application. Additionally, Burnett fails to disclose or to suggest that body region 106 is disposed in a substrate that is doped with a same type of charge carrier.

Burr is not seen to remedy the foregoing deficiencies in Burnett. Burr describes an architecture for NFETs and PFETs that includes a rail contact (e.g., 316), a well tie (e.g., 312), and a resistive well (e.g., 351). The resistive well is included within p-bulk material 306. N-region source 303 and N-region drain 305 are also included within p-bulk material 306. Accordingly, Burr cannot be seen to disclose or to suggest a substrate doped with charge carriers of a first type, a body region disposed within the substrate and doped with charge carriers of the first type, and a source region and drain region, both disposed in the body region and doped with charge carriers of a second type.

The Office Action appears to indicate, in the rejection of original Claim 2, that p-bulk material 306 of Burr could be combined with Burnett to produce a substrate doped with charge carriers of a first type, a body region disposed within the substrate and doped with charge carriers of the first type, and a source region and drain region, both disposed in the body region and doped with charge carriers of a second type. Applicants respectfully submit that the proposed combination is improper.

First, the references contain no motivation to combine the references as proposed. The Office Action cites column 1, lines 38 and 39 of Burr for such a motivation. The cited portion merely describes the desirability of lowering a device’s threshold voltage in some circumstances.

However, adding p-bulk material 306 to the device of Burnett would not lower the threshold voltage of the device. Accordingly, the desire to lower Burnett's threshold voltage could not motivate a person in the art to add p-bulk material 306 to the device of Burnett.

The proposed combination would also impermissibly change a principle of operation of Burnett. See MPEP §2143.01. Burnett clearly describes an SOI device, whose primary characteristic is strong isolation between body regions of adjacent devices. The proposed combination would require replacing insulator 104 with a p-type substrate, thereby creating a non-SOI device and depriving Burnett of such strong isolation.

Finally, the proposed combination, even if permissible, still lacks a source region and drain region disposed in the body region and doped with charge carriers of a type different from charge carriers of the body region.

Amended independent Claim 1 and its dependent Claims 3 through 6 are therefore believed to be in condition for allowance.

CONCLUSION

The outstanding Office Action presents a number of characterizations regarding each of the applied references, some of which are not directly addressed herein because they are not related to the rejections of the independent claims. Applicants do not necessarily agree with the characterizations and reserve the right to further discuss those characterizations.

For at least the reasons given above, it is submitted that the entire application is in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience. Alternatively, if there remains any question regarding the present application or any of the cited references, or if the Examiner has any further suggestions for expediting allowance of the present application, the Examiner is cordially requested to contact the undersigned via telephone at (203) 972-0049.

Respectfully submitted,

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